

**DRAFT**  
**Positive Train Control (PTC) Working Group**  
**Data & Implementation Task Force Meeting December 15, 1998**  
**New Orleans, LA**

**December 14: Data & Implementation Task Force Meeting convened at 8:00 a.m.**

- ☞ Steve Ditmeyer distributed DOT publication A The Road to Successful ITS Software Acquisition@ Volume I- Overview and Themes and Volume II-Software Acquisition Process Reference Guide. Steve briefly discussed the above two publications and encouraged the group to review the material.
  - ☞ Ted Bundy opened the meeting by discussing the emails concerning the team reports. Ted also asked the group for comments on the November minutes. The minutes, attachments, and other working documents are also published on the Volpe website - <http://204.166.190.40> with user ID of **rsac**, and password of **rsac**. ID and password will **not** be case sensitive.
  - ☞ Rich McCord briefed the group on the Operating Team=s report. The team met for the first time in November and have drafted a report for the Report to Congress.
  - ☞ Grady Cothen discussed the table outlining the 14 parts to the Report to Congress. If any member of the Implementation Team has comments on the reports, then they need to report to the author of the report section.
  - ☞ Mark Jones discussed the PTC and Grade Crossing Safety Report. The group met last week in Louisville, KY to draft their document for the report. Report contains an overview section giving credit to all involved in grade crossing safety, PTC/ITS Applications, Future Technological Applications, HRI User Service #30 Standards Requirements, Recommendations and Wayside Detectors.
- Gerhard Thelen stated that he thought the North Carolina pilot project on grade crossing safety should be included in the ITS Team Report. Mark Jones said that this had been discussed and it was decided by the team that this wasn=t a PTC or ITS project, and shouldn=t be mentioned. The ITS team is going to make a brief reference to the project in their report, and the Economic Team will make a short report on it in their overall report.
- ☞ Howard Moody indicated that Dick Stotts has taken the Compendium of Current Positive Train Control Projects, reducing the report by preparing a synopsis of the different parts.
  - ☞ Mr. Cothen reported to the group that the report will be the voice of the committee PTC Working Group and the full RSAC. The body of the report will not be edited by the Federal Railroad Administration, only the introduction and the conclusion.
  - ☞ Frank Roskind briefed the group on the report of the Economics Team. The group met yesterday and will meet again in January to finalize their draft their Report. (**Attachment #1**)
  - ☞ Dr. Sherry Borener presented the CRAM II update. (Document # 08 of Ted Bundy=s document table - Section IV.C - executive level summary of corridor Risk Assessment Model work - draft partial input.) (**Attachment #2**).
  - ☞ Ted Bundy summarized the groups responsibilities in finalizing the individual reports for the Report to Congress. The afternoon is set aside for everyone to read each of the reports. Each task force group (labor, management,

suppliers) should assign one person to communicate concerns with the person listed on the table as the AAuthor@ of that particular report.

**The meeting adjourned at 11:15 a.m. for break-out into teams and would meet as scheduled in the morning.**

**December 16: Data & Implementation Task Force Meeting convened at 9:30 a.m.**

- ☞ Grady Cothen discussed the meeting in January. FRA has not been able to secure meeting rooms because of a city wide convention. Rail labor representatives requested that FRA try the BWI Airport area, rail management the Dulles Airport area.
- ☞ Bob McCown, FRA RDV, will work with AAR on the spectrum needs and communication report.
- ☞ Grady Cothen indicated that the Data & Implementation groups= future meetings, after the Report to Congress, would be for updates on the different projects. The group will possibly meet every two months, quarterly, or as needed.

Mr. Cothen requested that we need to have editorial conformity. The sections that are complete in draft form (copies were distributed on December 15) and the group discussed the elements or changes to these reports on December 16. This is the last time these documents will be discussed. For future discussions, we will only go over the new sections that have not been distributed to date.

AAR has requested a demonstration on January 20 at Volpe Center to become familiar with results being generated and exercise the model more to see what it could do in hypothetical situations. Grady invited the group to this general symposium and if anyone wants to attend, to get in touch with Bob Dorer or Dr. Borener.

The **January 26 and 27 Data & Implementation Task Force** meeting will be held at the Marriott, BWI Airport, 1743 West Nursery Road, Telephone 410-859-8300.

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The group went through the 14 sections of the draft Report to the Congress with comments as noted in the following table.

No.

PTC Report to Congress Remarks/Comments from December 1998 Meeting

01

02

Page 1

- Suppliers will be added to the first paragraph of the report.
- Management has concerns with the Asocietal benefits@ statement mentioned in the second paragraph of the report. **FRA will ensure that this statement is better anchored in the body of the full report.**

Page 2

- Management would like to strike the last sentence of the last paragraph. Labor asked Awhy?@. Grady said that he viewed a logical role for the Implementation Task Force would be to remain briefed on progress and work toward the statement made in this sentence. **Sentence will be re-worded or dropped from the introduction.**

Page 3

- Labor thinks the first paragraph on pg. 3 needs to be changed to indicate that the cost/benefit analysis is inclusive. Don=t like the Asafety benefits alone do not appear to support the required investments except where high-speed passenger operation are conducted@. Management & Merrill Travis said that they also had problems with the statement. **The first two sentences of the third page will be reviewed, and the second sentence of this paragraph will be removed from the report from the time being.**

03

Labor expressed concerns with the ALevel 3@ statement regarding Aeach **existing** switch@ rather than Aeach switch@.

Suppliers were concerned with the reference in the Alevels@ to specific systems, stating that the systems referred to are not hierarchical in nature.

04

Labor wanted a sentence concerning maintenance and testing to be reinserted to the text of the report.

Merrill Travis wanted some information regarding the high cost of an evaluation project in Illinois (\$6,000 per highway vehicle) inserted into the report. It was pointed out that a statement of the high costs was already at the bottom of Page 5 of this report.

This section will be discussed again after completion. Work in progress.

05

Howard Moody wanted Stotts= document (# 07) to be used in lieu of this document. Stotts= document is still a work in

progress.

**The compendium will become an appendix to the report; Stotts= document # 07 will become this section of the report.**

The text referring to the CR/CSX/NS joint project will be dropped, because this is not a PTC project.

**06**

The section entitled **POSITIONING TECHNOLOGIES**: Under AFindings@: In the first sentence the work Aimplemented@ was replaced by the word Atested@.

The section entitled **DECISION MAKING PROCESSES**: Under AFindings@: The last sentence about the CSX-CBTM being the only U.S. system is being changed.

**ARCHITECTURE INTEROPERABILITY**: Aproximity warning systems@ is changed to Atrain Guard@.

**07**

Becomes # 05 of the report. Labor wants to see it again after the additional language proposed in brackets is added. This section will be discussed again after completion. Work in progress.

**08**

Revised version to be copied and handed out after lunch.

**09**

No further comments. This section will be discussed again after completion. Work in progress.

**10**

Doug Horstman made a change in a portion of the report that he had accomplished.

Larry Milhon said that he would have some comments because the team=s charge wasn=t to get into rules yet, just to develop a concept on the rules would be necessary.

Bob Gallamore didn=t think the statement regarding failure to achieve interoperability as problematic.

Howard Moody said that there were some duplications and contradictions, and that Bob should get together with Rich McCord before final decisions were made.

**Document will be revised based on input from operating rules team.**

**11**

Gary Pruitt from ARINC said that this section will be moved to Section III, probably III. C.

Labor had a number of concerns, all of which Ron Lindsey will address

Pg 1, the Acore features@, need to be verbatim. Bundy will give to Lindsey.

## 12

Fran Hooper stated that the passenger section is inadequate. She said that it needs to have some stuff up-front about the one million passengers per day on commuter, plus the intercity stuff from ATK. She also said that there needs to be a lot more about the growth and nationwide demand for rail service. Also, fuel consumption section needs to have something about the passenger piece and how it saves fuel.

Fran Hooper will provide for commuter; Bob Kollmar, ATK Director of Engineering Initiatives, will do the ATK piece.

## 13

Nick Marsh said that management would like to try a different approach for this section, more or less using the same methodology that the railroads have done to try and do this for internal justification for PTC projects. Nick Marsh indicated that management will write an entirely new document for this section and will have it ready for everyone, via email, the first week in January.

James Stem and Bill Clifford said that labor liked the document as written, and saw no need for changes. Stem said that they would look at any alternative document that management created, but they weren't too sure that they would find any alternatives acceptable.

## 14

NDGPS (Shamberger's document) Fran Hooper said that there should be a recommendation in the document stating that the PTC, RSAC, fully supports the NDGPS and is in favor of continued public funding necessary for deployment. The group gave the proposal a thumbs-up@.



Fran Hooper indicated that this group supports the continued funding for the deployment of NDGPS and indicated that a statement should be included in Section #13 of the report. A vote was taken and the group unanimously concurred with Ms. Hooper's statement.



Grady Cothen distributed Section #08, Volpe's report on CRAM II. If anyone has any comments on this report then relay these comments to Bob Dorer.

The reports from the Standards Group will be distributed by email to the Data & Implementation Group.

ARINC will reconcile the Accident Statistics Review, ASCAP, Proximity Warning System, and Radio Frequency Spectrum Report.



Howard Moody recapped the missing sections of the report, which are:

Executive Summary

Recap of the 1994 Report and Action Plan

NJT & Alaska RR - (D. Stotts)

Commentary and discussion control concepts, open and closed, from ARINC

Approach to safety management (Standards provided 12/16)

Intercity passenger report - (Robert Kollmar)

Appendices

Glossary

Mr. Moody will send via email, to Ted Bundy and Bob Dorer, an updated entire report by approximately January 10, 1999. Each member will have approximately one week to comment.



Grady Cothen requested that if anyone from this group wants to make a presentation at the RSAC meeting on January 28, 1999, at Washington, D. C. to notify him. He said that FRA would work up some sort of an outline for the presentation.

The meeting adjourned at 3:10 p.m.

1. PTC Economic Team Status
  1. December 15, 1998
2. PTC Economic Team Status
  1. Accident Avoidance Benefits
3. PTC Economics Team Status
  1. Areas of Tentative Agreement
  2. Willingness to Pay to Avoid a Fatality: \$2,700,000
  3. Willingness to Pay to Avoid an Employee Injury: \$100,000
  4. Cost of HazMat Remediation: \$250,000 per Hazmat Car Releasing
  5. Lading Loss and Damage: \$6,500 per freight car derailed
  6. Freight Rerailing or Wrecking Cost: \$2,500 plus \$750/loco; \$300/car
4. PTC Economics Team Status
  1. New Areas of Tentative Agreement
  2. Damage to Property off the Right-of-Way: \$2,000 per accident
5. PTC Economics Team Status
  1. Tentative Consensus to Discontinue Consideration
  2. Environmental Costs not Remediated (Unless discussion with EPA provides more data)
  3. Business Costs of Evacuations (Included in Evacuation Costs)
6. PTC Economics Team Status
  1. Passenger Issues
  2. Willingness to Pay to Avoid a Passenger Injury
    1. Reporting standards are different
    2. Injuries may be different
  3. Track and Equipment damage
    1. Equipment is unique
  4. Wreck Clearing and removal
  5. Delay Costs (APTA presented new data on passenger incomes 12/14/98)
7. PTC Economics Team Status
  1. Track and Equipment Damage
  2. Economic Level of Repair vs. Book Value
    1. CSX presented additional information on ELOR, and they continue to explore historical values of ELOR
  3. Earlier Reports suggested a multiplier of 1.5625 to 2.11
  4. Passenger Equipment is Unique and May Require a Different Multiplier
8. PTC Economics Team Status
  1. Evacuation Costs
  2. AAR Has a Relevant Study

1. AAR=s study includes business costs
  3. FRA Had Proposed \$1,000 per Person Evacuated
  4. AAR Has Some Data on Duration of Evacuations
9. PTC Economics Team Status
  1. Freight Train Delay Costs
  2. Tentative Agreement on \$250 per Train-Hour
  3. FRA Had Proposed \$300 per Train-Hour Times 2 Hours per Accident Times Number of Trains in 2 Hours (Trains per Day/12)
  1. 4. Group is Discussing Weighting by Severity
  5. There may be New Evidence on Delay Costs
10. PTC Economics Team Status
  1. Damage to non-RR Wayside Persons and Property
  2. This issue is tentatively resolved: \$2,000 per accident
11. PTC Economics Team Status
  1. PTC System Costs
12. PTC Economics Team Status
  1. PTC System Costs
  2. Costs by Level, Type
  3. Four Levels
  4. Types of Costs
    1. Per Locomotive/Power Unit
    2. Per Mile (Route or Track?)
    3. Per Installation
      - (1) Central and Software Development Costs
13. PTC Economics Team Status
  1. Costs Per Locomotive/Power Unit
  2. Tentative Agreement
    1. Level 1
      - (1) \$40,000 per Locomotive/ Power Unit
      - (2) Group Considered Effectiveness (Must be the Same at All CRAM Levels)
    2. Levels 2, 3, and 4
      - (1) These Levels Don=t Require Different On-Board Equipment
      - (2) \$75,000 per Locomotive/ Power Unit
14. PTC Economics Team Status
  1. Costs Per Mile
  2. Per Route-Mile
    1. Communications Equipment around \$600 per Route-mile
    2. Bridge detectors: around \$21,000 per Route-mile
  3. Per Track-Mile
    1. Wayside Interface Units
      - (1) Discussion is Focusing on About \$10,000 per WIU; \$2,875 per track-mile
      - (2) WIU Cost is Different for Various Types of WIU
15. PTC Economics Team Status
  1. Costs per mile, Level 4 (High Level of Function)
  2. Dark Territory:
    1. \$21,644 per route-mile
    2. \$39,000 per track-mile

- 3. ABS
  - 1. \$21,644 per route-mile
  - 2. \$30,000 per track-mile
- 4. CTC
  - 1. \$21,644 per route-mile
  - 2. \$6,000 per track-mile
- 16. PTC Economics Team Status
  - 1. 1. Cost per mile, PTS-like system
  - 2. Dark Territory
    - 1. \$2,875 per mile
  - 3. ABS
    - 1. \$2,875 per mile
  - 4. CTC
    - 1. \$2,875 per mile
- 17. PTC Economics Team Status
  - 1. Unit costs
  - 2. Data Radios: \$45,000 each, 1 per 20 miles
  - 3. High Speed Yard Radios: \$10,000 each, 1 per 250 miles
  - 4. DGPS: \$20,000 each, 1 per 100 miles
  - 5. Track circuits (Dark territory): \$7,000 per mile
  - 6. WIU (Dark terr.): \$10,000 each, 1 per 5 miles
  - 7. Switch monitor (\$5,000 each) and WIU (\$10,000 each), average 2 switches per 5 miles:
    - 1. Average difference \$6,000/mile in CTC
    - 2. Average difference \$30,000/mile in dark territory
- 18. PTC Economics Team Status
  - 1. Unit costs, continued
  - 2. Bridge Monitors
    - 1. Bridge position
    - 2. Bridge integrity
    - 3. High water
  - 3. High Wind Detectors, \$5,000 each plus \$10,000 for a WIU
    - 1. Estimated BNSF has 100-implied cost \$56 per mile west of the Mississippi
  - 4. Interfacing existing detectors, \$10,000 each
    - 1. BNSF has 1350 detectors, implied cost \$508 per route-mile
    - 2.
- 19. PTC Economics Team Status
  - 1. Unit cost issues
  - 2. Slide Fence Detectors
  - 3. High Water Detectors
- 20. PTC Economics Team Status
  - 1. Single cost issues
  - 2. Early indications are \$20,000,000 per railroad to \$100,000,000 to develop a system and install one time, single unit items
- 21. PTC Economics Team Status
  - 1. Alternatives to PTC Technology, Safety
  - 2. Positive Signal Comparator



3. Human Factors
  1. Fatigue countermeasures
  2. Simplified operating rules
  3. Training
4. Signalize Dark Territory
5. Enhance Signal Systems
1. 22. PTC Economics Team Status
  1. Alternatives to PTC Technology, Business Benefits
  2. Work Order Reporting
  3. Locomotive Health Monitoring
  4. Train Pacing, Meet/Pass Planning
23. PTC Economics Team Status
  1. Remaining to be Started
24. PTC Economics Team Status
  1. Remaining to be Started
  2. Other-than-Safety Benefits
    1. Other work will be presented to the Task Force
  3. Intermodal Considerations
    1. FRA Office of Policy is working on this
  4. Implications for Traffic, Information and Asset Management
  5. Analysis, Conclusions and Reports
25. PTC Economics Team Status
  1. Future Meetings
  2. January 14 and 15, 1999, Washington, DC (APTA), Group will make last minute edits

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## CRAM II Update December 1998

819 accidents, 814 located geographically

- New network has 8592 segments
- New corridors number 186 (last round 188)
- Accidents: 247 collisions
- 423 derailments
- 149 Other (including MOW)

### Regression Results - Level 4

- Intercept -11.68
- Logtons 0.0143
- Log2tons 0.0227
- Multitrak 0.4252
- Switches per 0.0258
- Curves per 0.0760
- Meancrvl -1.6122
- CTC -0.2662
- Lwavgspd -0,0156

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### Old Results (December 1997)

- *Intercept* -12.4665
- *Log2car* 0.0112
- *Paxratio* 0.916
- *Multitrak* 0.4996
- *Switper* 0.00302
- *Curper* 0.0078
- *Meancrve* 0.042
- *Hispeed* -0.0218

### Cost Assignment

- Fatalities, injuries, dollar damages unchanged
- Evacuations modified
  - Formerly 0.25 \* the 5 mile population surrounding link
  - Currently 0.1 \* the 5 mile population
- $P(\text{release}) = 24/179$   $P(\text{evac}) = 17/179$
- Corridor Distributions
- Show XLS files
- Corridors display differences based upon total costs, predicted and Anormalized@ rates
- Sensitive to new evacuation numbers and absence of a passenger parameter in highest level

